THE
BOTANICAL GAZETTE

EDITOR
JOHN MERLE COULTER

VOLUME LVI

JULY–DECEMBER, 1913

WITH FOURTEEN PLATES AND ONE HUNDRED AND SIXTY-THREE FIGURES

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS

Published
July, August, September, October, November, December, 1913

Composed and Printed By
The University of Chicago Press
Chicago, Illinois, U.S.A.

TABLE OF CONTENTS

		PAGE
The life history of *Zanardinia*. Contributions from the Hull Botanical Laboratory **174** (with twenty-four figures and plates I–IV)	*Shigéo Yamanouchi*	1
The origin of the erect cells in the phloem of the Abietineae (with twelve figures)	*M. A. Chrysler*	36
Undescribed plants from Guatemala and other Central American Republics. XXXVII	*John Donnell Smith*	51
Contributions from the Rocky Mountain Herbarium. XIII	*Aven Nelson*	63
Seed production in *Yucca glauca*	*Max M. Ellis*	72
The origin and development of the embryo sac and embryo of *Dendrophthora opuntioides* and *D. gracile*. I (with six figures and plates V and VI)	*Harlan Harvey York*	89
The physiology of the pollen of *Trifolium pratense*. Contributions from the Hull Botanical Laboratory **175** (with one figure)	*J. N. Martin*	112
Observations on the morphology of the aroids (with forty-seven figures)	*James Ellis Gow*	127
Summer evaporation intensity as a determining factor in the distribution of vegetation in Connecticut	*George Elwood Nichols*	143
Semipermeability of seed coats. Contributions from the Hull Botanical Laboratory **176** (with nine figures)	*Charles A. Shull*	169
The origin and development of the embryo sac and embryo of *Dendrophthora opuntioides* and *D. gracile*. II (with plate VII)	*Harlan Harvey York*	200
Xenia and the endosperm of angiosperms	*E. M. East*	217
Can fungi living in agricultural soil assimilate free nitrogen? (with eighteen figures)	*H. N. Goddard*	249
Phryma leptostachya L., a morphological study (with plates VIII–X)	*Theo. Holm*	306
Nuclear division in *Spirogyra crassa* (with plates XI and XII)	*M. L. Merriman*	319
Filices Purdomianae	*Carl Christensen*	331

35705

PAGE

Temperature coefficients in plant geography and climatology (with three figures) *Burton Edward Livingston* and *Grace Johnson Livingston* 349

Apogamy in *Atamosco* (with plates XIII and XIV) *Lula Pace* 376

The tepary, a new cultivated legume from the southwest (with eleven figures) - - - *George F. Freeman* 395

A comparison of the American brown-rot fungus with *Sclerotinia fructigena* and *S. cinerea* of Europe (with six figures) - - - - - *W. A. Matheny* 418

Osmotic pressure in potatoes. Contributions from the Hull Botanical Laboratory **177** (with four figures) - - - - - - - - - - *M. A. Brannon* 433

The castor bean plant and laboratory air. Contributions from the Hull Botanical Laboratory **178** - - - - - - - - - - *E. M. Harvey* 439

Botanical phenomena and the problem of recent coastal subsidence (with nine figures) - *Douglas Wilson Johnson* 449

Western plant studies. II - *Aven Nelson* and *J. Francis Macbride* 469

Chemical and physical changes in geotropic stimulation and response. Contributions from the Hull Botanical Laboratory **179** (with six figures) - - - - - - - - - *Eva O. Schley* 480

Studies in the genus *Bidens*. I. Contributions from the Hull Botanical Laboratory **180** *Earl E. Sherff* 490

Some Alaskan lichens (with two figures) - - *R. Heber Howe, Jr.* 496

BRIEFER ARTICLES—

The use of celloidin membranes for the demonstration of osmosis (with three figures) - - *Gilbert Morgan Smith* 225

Imbedding and warming stand (with two figures) *L. Knudson* 339

Included cytoplasm in fertilization - - *Margaret C. Ferguson* 501

Henry Willey (with portrait) - - - - *J. M. C.* 502

CURRENT LITERATURE - - - - - - 79, 153, 230, 341, 443, 504

For titles of book reviews see index under author's name and reviews

Papers noticed in "Notes for Students" are indexed under author's name and subjects

---

DATES OF PUBLICATION

No. 1, July 16; No. 2, August 14; No. 3, September 17; No. 4, October 15; No. 5, November 15; No. 6, December 18.

ERRATA

P. 53, line 14 from top, begin new sentence with Vexillum.
P. 58, line 10 from top, for Comarea read Comarca.
P. 60, first line, for glandula read glandulae.
P. 60, line 5 from top, for purpurpascentes read purpurascentes.
P. 184, last line, for solutions read solution.
Pp. 189 and 191, exchange legends of fig. 8 and fig. 9.
P. 261, line 18 from top, for fungus read fungous.
Pp. 289, 290, 293, tables VI, VII, VIII, last column, for (total control) read (total-control).